

SPECIFICATIONS

CUSTOMER	:	
SAMPLE CODE	:	SG320240WRFDBAH31Q
MASS PRODUCTION CODE	:	PG320240WRFDBAH31Q
SAMPLE VERSION	:	01
SPECIFICATIONS EDITION	:	002
DRAWING NO. (Ver.)	:	JLMD-PG320240WRFDBAH31Q_003
PACKAGING NO. (Ver.)	:	JPKG-PG320240WRFDBAH31Q_001

Customer Approved

Date:



Approved	Checked	Designer
閻偉	張久慧	劉進

- ☐ Preliminary specification for design input
- ☒ Specification for sample approval

POWERTIP TECH. CORP.

Headquarters: No.8, 6 th Road, Taichung Industrial Park, Taichung, Taiwan 台中市 407 工業區六路 8 號	TEL: 886-4-2355-8168 FAX: 886-4-2355-8166	E-mail: sales@powertip.com.tw Http://www.powertip.com.tw
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NO.PT-A-005-8

RECORDS OF REVISION

Date (mm / dd / yyyy)	Ver.	Edi.	Description	Page	Design by
07/02/2013	01	001	New Drawing	-	劉進
08/31/2013	01	002	Sample Specification	-	劉進

Total : 28 pages

Contents

1. SPECIFICATIONS

- 1.1 Features
- 1.2 Mechanical Specifications
- 1.3 Absolute Maximum Ratings
- 1.4 DC Electrical Characteristics
- 1.5 Optical Characteristics
- 1.6 Backlight Characteristics

2. MODULE STRUCTURE

- 2.1 Counter Drawing
- 2.2 Interface Pin Description
- 2.3 Timing Characteristics
- 2.4 Display Command
- 2.5 Jumper

3. QUALITY ASSURANCE SYSTEM

- 3.1 Quality Assurance Flow Chart
- 3.2 Inspection Specification

4. RELIABILITY TEST

- 4.1 Reliability Test Condition

5. PRECAUTION RELATING PRODUCT HANDLING

- 5.1 Safety
- 5.2 Handling
- 5.3 Storage
- 5.4 Terms of Warranty

- Appendix:
- 1. LCM Drawing
 - 2. Packaging

1. SPECIFICATIONS

1.1 Features

Item	Standard Value
Display Type	320*240 dots
LCD Type	FSTN, Positive ,Transflective ,Extended Temp.
Driver Condition	LCD Module : 1/240 Duty , 1/16Bias
Viewing Direction	6 O'clock
Backlight	LED Back Light
Weight	262g
Interface	8 bits parallel data input for 8080 series
Other(controller / driver IC)	RA8835
ROHS	THIS PRODUCT CONFORMS THE ROHS OF PTC Detail information please refer web site : http://www.powertip.com.tw/news.php?area_id_view=1085560481/

1.2 Mechanical Specifications

Item	Standard Value	Unit
Outline Dimension	148.02(L) *120.24(w) * 21.0(H)(Max)	mm
Viewing Area	120.14(L) * 92.14(w)	mm
Active Area	115.18(L) * 86.38(w)	mm
Dot Size	0.34(L) * 0.34(w)	mm
Dot Pitch	0.36(L) * 0.36(w)	mm

Note : For detailed information please refer to LCM drawing

1.3 Absolute Maximum Ratings

Item	Symbol	Condition	Min.	Max.	Unit
Power Supply Voltage	V _{DD}	-	-0.3	+7.0	V
Input Voltage	V _{IN}	-	-0.3	V _{DD} +0.3	V
Operating Temperature	T _{OP}	-	-20	70	°C
Storage Temperature	T _{ST}	-	-30	80	°C
Storage Humidity	H _D	Ta < 60 °C	-	90	%RH

1.4 DC Electrical Characteristics

$V_{DD}=5.0\text{ V} \pm 10\%$, $V_{SS} = 0\text{V}$, $T_a = 25^\circ\text{C}$

Item	Symbol	Condition	Min.	Typ.	Max.	Unit
Logic Supply Voltage	V_{DD}	-	4.8	5.0	5.2	V
“H” Input Voltage	V_{IH}	-	$0.5 V_{DD}$	-	V_{DD}	V
“L” Input Voltage	V_{IL}	-	V_{SS}	-	$0.2 V_{DD}$	V
“H” Output Voltage	V_{OH}	$I_{OH}=-8\text{mA}$	$V_{DD}-0.4$	-	-	V
“L” Output Voltage	V_{OL}	$I_{OL}=8\text{mA}$	-	-	$V_{SS}+0.4$	V
Supply Current	I_{DD}	$V_{DD}=5.0\text{V}; V_{OP}=22.0\text{V};$ Pattern= Horizontal line *1	-	50	80	mA
LCM Driver Voltage	$V_{OP}*2$	$-20^\circ\text{C} *2$	21.9	22.1	22.3	V
		$25^\circ\text{C} *2$	21.8	22.0	22.2	
		$70^\circ\text{C} *2$	21.5	21.7	21.9	

NOTE: *1 The Maximum current display;

*2 The VOP test point is $V_{OP+} \sim V_{OP-}$

1.5 Optical Characteristics

LCD Panel : 1/240Duty , 1/15Bias , $V_{LCD}=22.0V$, $T_a=25^{\circ}C$

Item		Symbol	Conditions	Min.	Typ.	Max.	Unit	Reference
Response Time	Rise	tr	-	-	150	230	ms	Note2
	Fall	tf		-	320	480		
Viewing angle range	Top	θ+	C≥2.0	-	40	-	Deg.	Notes 1
	Bottom	θ-		-	40	-		
	Left	θL		-	45	-		
	Right	θR		-	45	-		
Contrast Ratio		C	-	-	3.0	-	-	Note 3
Average Brightness (with LCD) *2		IV	IF=160mA	25	35	-	cd/m ²	Note 4
CIE Color Coordinate (With LCD)*2	x	0.25		0.30	0.35	nm		
	y	0.30		0.35	0.40			
Uniformity *1		△B		70	-	-	%	

Note 4 :

1 : $\Delta B = B(\min) / B(\max) * 100\%$

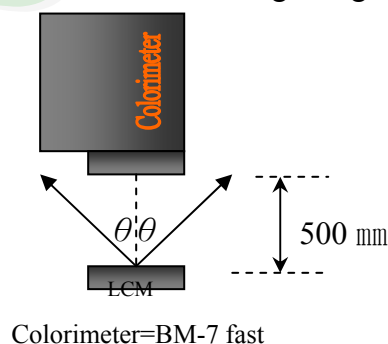
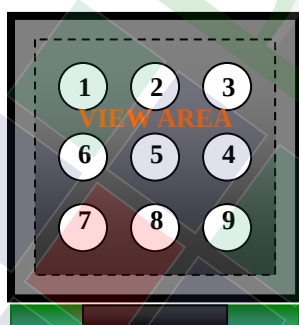
2 : Measurement Condition for Optical Characteristics:

a : Environment: $25^{\circ}C \pm 5^{\circ}C$ / $60 \pm 20\%$ R.H , no wind , dark room below 10 Lux at typical lamp current and typical operating frequency.

b : Measurement Distance: 500 ± 50 mm , ($\theta = 0^{\circ}$)

c : Equipment: TOPCON BM-7 fast , (field 1 $^{\circ}$) , after 10 minutes operation.

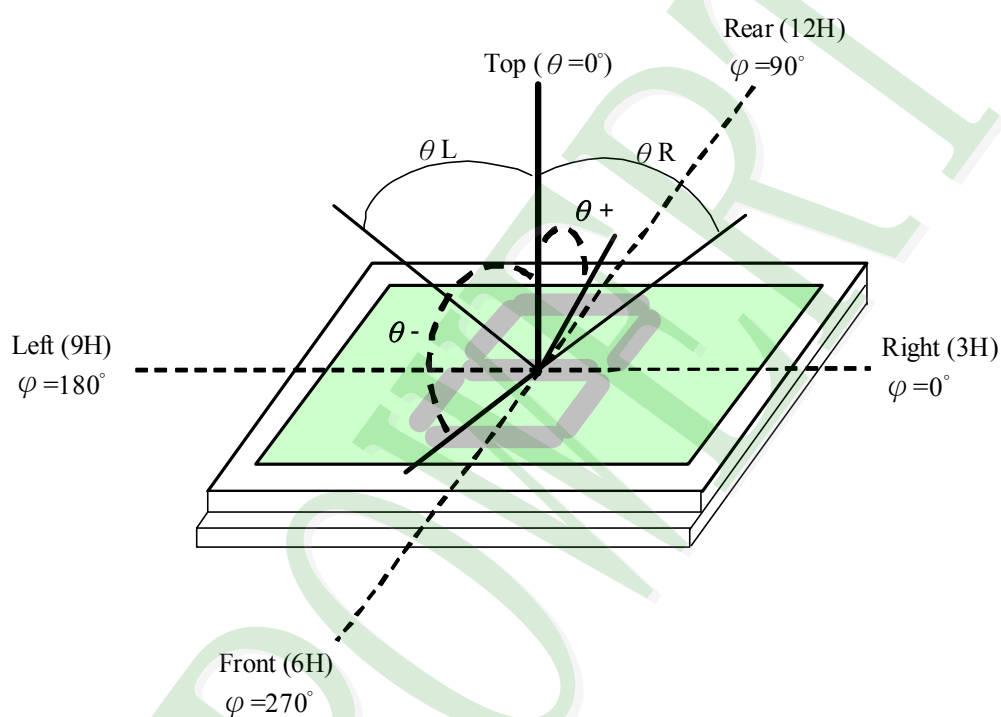
d : The uncertainty of the C.I.E coordinate measurement ± 0.01 , Average Brightness $\pm 4\%$



Note 1.

Optical characteristics-2

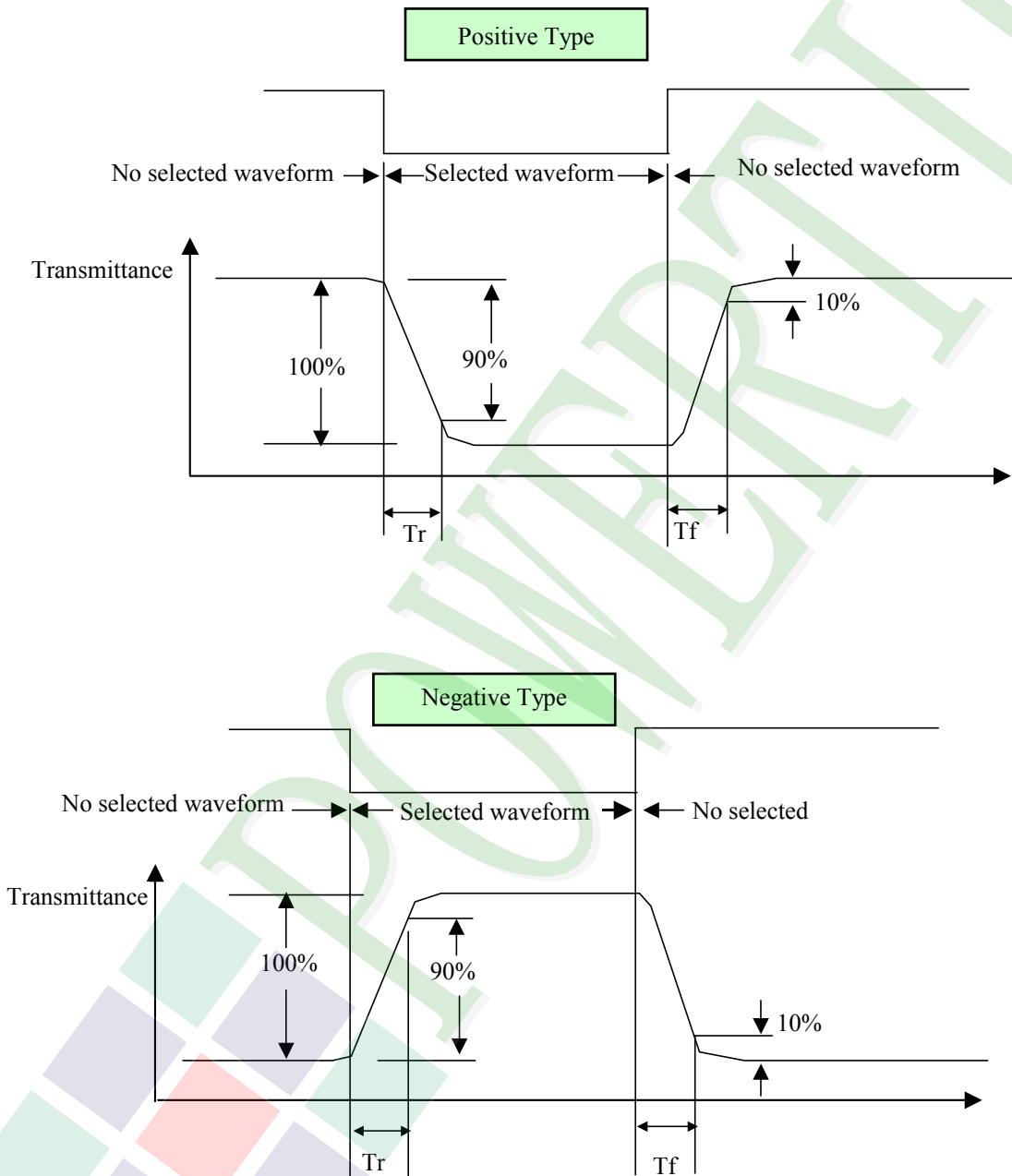
Viewing angle



Note 2.

Optical characteristics-3

Fig.2 Definition of response time



Electrical characteristics-2

※2 Drive waveform

V_{op} : Drive voltage

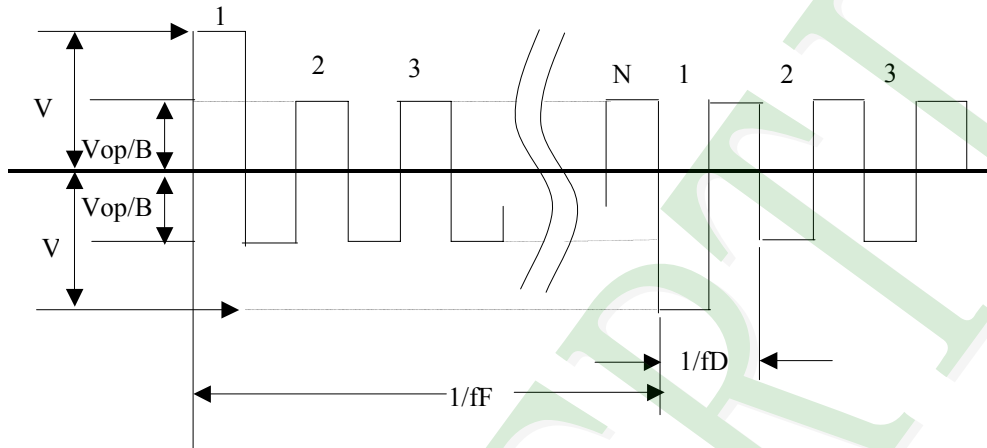
$1/B$: Bias

N : Duty

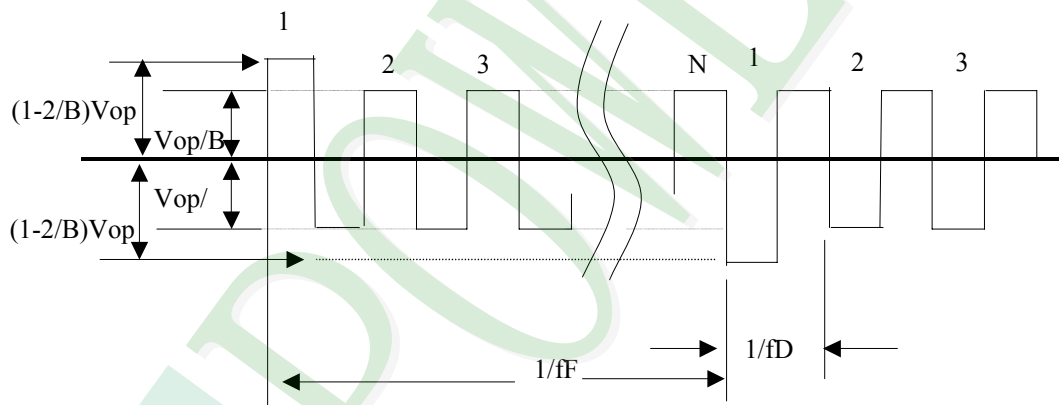
f_F : Frame frequency

f_D : Drive frequency

(1) Selected waveform



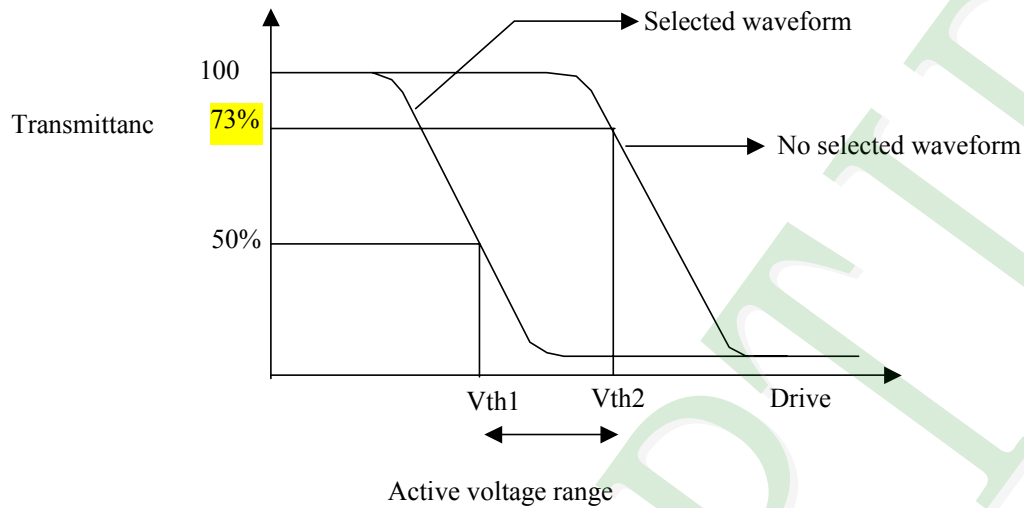
(2) Non- Selected wave form



Note:

Frame frequency is defined as follows: Common side supply voltage peak - to - peak / 2 = 1 period

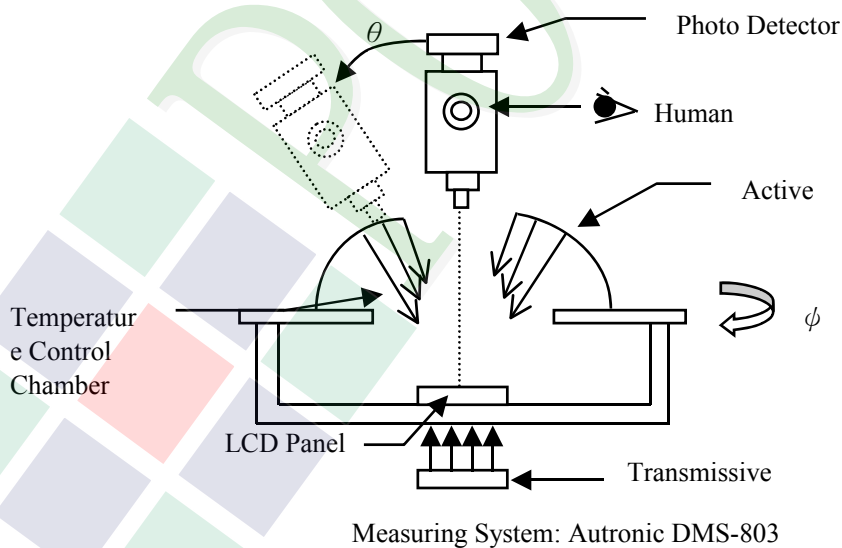
Note 3. : Definition of Vth



	Vth1	Vth2
View direction	10°	40°
Drive waveform	(Selected waveform)	(No selected waveform)
Transmittance	50%	73%

※1 Contrast ratio
= (Brightness in OFF state) / (Brightness in ON state)

Outline of Electro-Optical Characteristics Measuring System



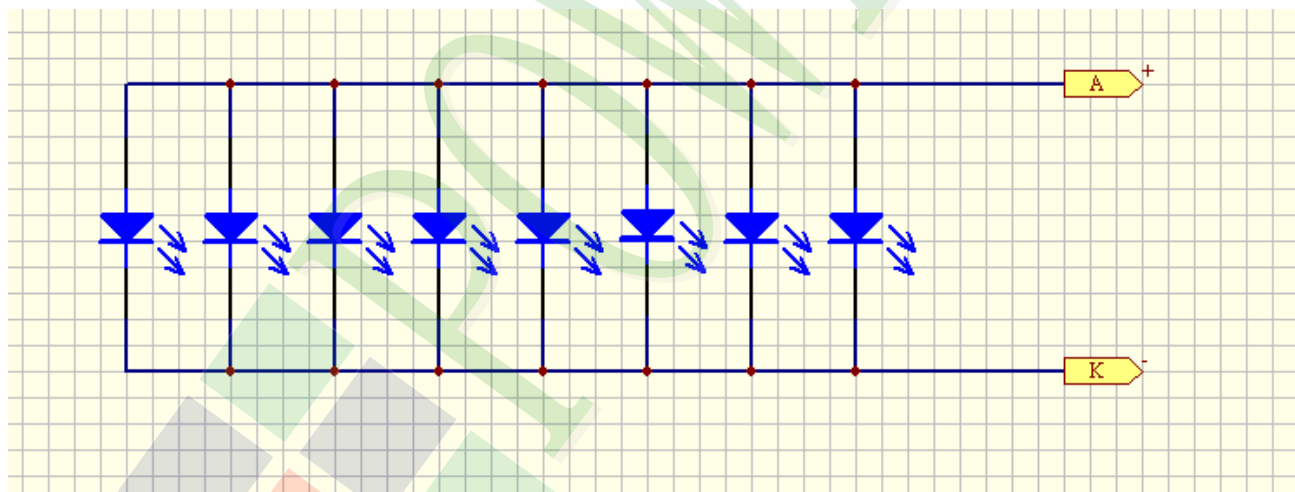
1.6 Backlight Characteristics

Maximum Ratings

Item	Symbol	Conditions	Min.	Max.	Unit
Forward Current	IF	Ta =25°C	-	160	mA
Reverse Voltage	VR	Ta =25°C	-	5	V
Reverse Current	IR	VR=5V	-	10	uA
Power Dissipation	PD	Ta =25°C	-	0.8	W

Electrical / Optical Characteristics

Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
Forward Voltage	VF	IF=160mA	-	3.4	4.0	V
Average Brightness (without LCD)	IV		210	280	-	cd/m2
CIE Color Coordinate (without LCD)	X		0.25	0.28	0.31	-
	Y		0.26	0.29	0.32	
Color	White					



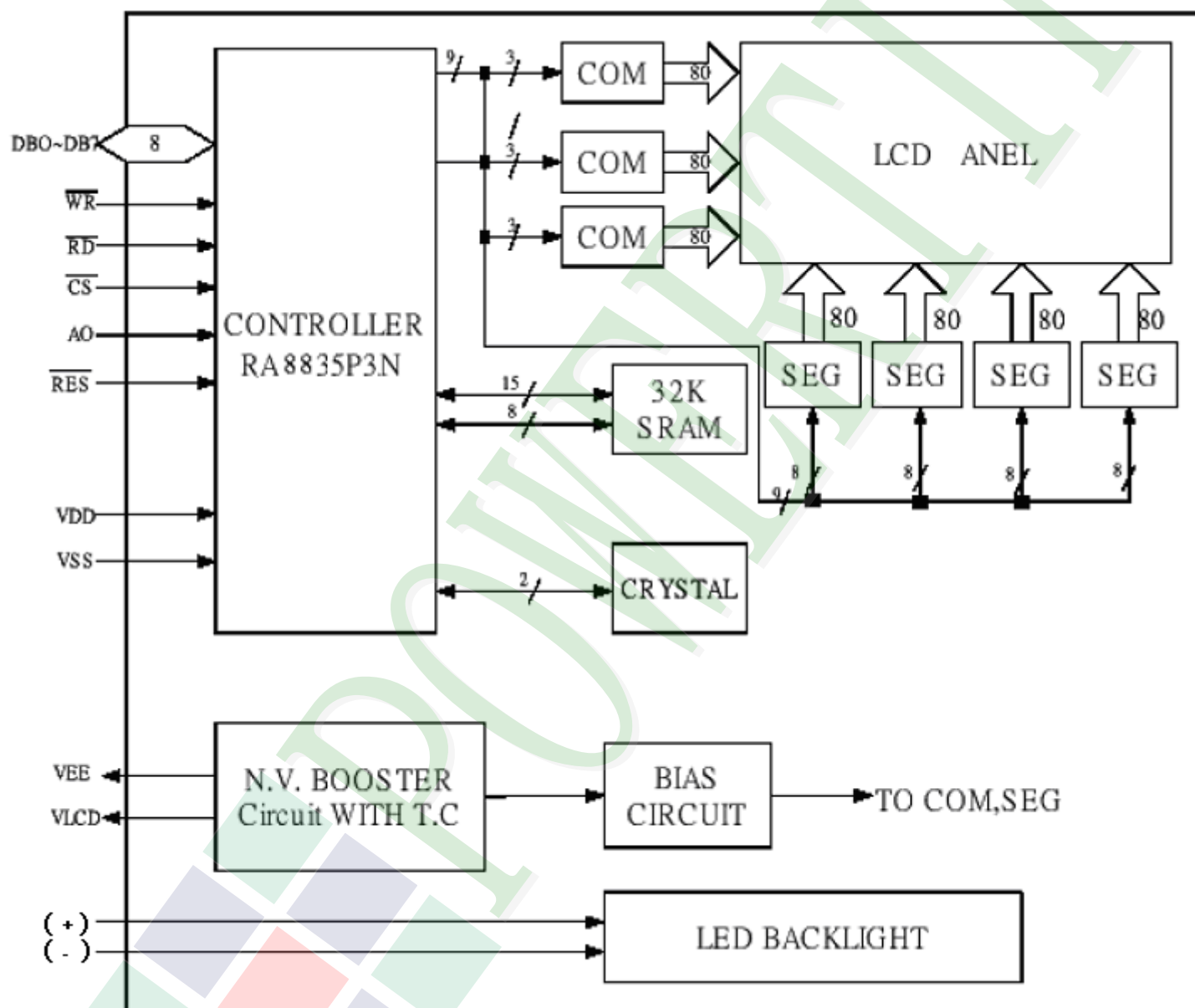
2. MODULE STRUCTURE

2.1 Counter Drawing

2.1.1 LCM Mechanical Diagram

* See Appendix

2.1.2 Block Diagram



2.2 Interface Pin Description

Pin No.	Symbol	Function
1	VSS	Ground(Vss=0V)
2	VDD	Power Supply
3	VLCD	Operating Voltage for LCD
4	/RD	Data read (read data from the module at "L")
5	/WR	Data write (write data to the module at "L")
6	A0	Command/Data read or write select (H:command L:data)
7	DB0	Data bus
8	DB1	Data bus
9	DB2	Data bus
10	DB3	Data bus
11	DB4	Data bus
12	DB5	Data bus
13	DB6	Data bus
14	DB7	Data bus
15	/CS	Chip select ,active "L"
16	/RES	Reset input ,active "L"
17	VEE	Negative voltage out
18	FG	Frame ground (connect to metal bezel)
19	NC	Not connection(Must be open)
20	NC	Not connection(Must be open)
-	(+)	Power supply for LED backlight. (Anode).(Red Line)
-	(-)	Power supply for LED backlight. (Cathode).(White Line)

2.2.1 Refer Initial Code

```
write_com(0x40);           //initialize device and display
write_dat(0x30);
write_dat(0x87);
write_dat(0x07);
write_dat(39);
write_dat(65);
write_dat(239);
write_dat(0x28);
write_dat(0x00);

write_com(0x44);           //Set display start address and display regions
write_dat(0x00);
write_dat(0x00);
write_dat(0xef);
write_dat(0xb0);
write_dat(0x04);
write_dat(0xef);

write_com(0x5a);           //set number of pixels to scroll=0
write_dat(0x00);

write_com(0x5b);           //select layerd screen composition and screen text/graphics mode
write_dat(0x00);

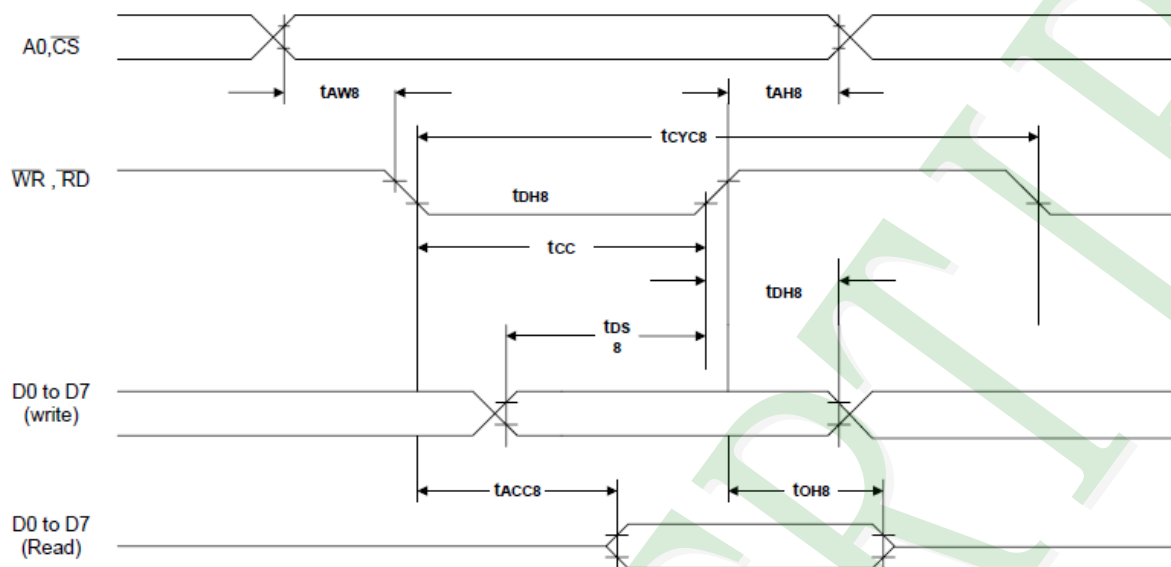
write_com(0x58);           //set display off and display flashing
write_dat(0x14);

write_com(0x5d);           //set cursor type
write_dat(0x07);
write_dat(0x00);

write_com(0x59);           //set display on and display flashing
write_dat(0x14);
```

2.3 Timing Characteristics

8080 Family Interface Timing



Ta = -20 to 75°C

Signal	Symbol	Parameter	V _{DD} = 4.5 to 5.5V		V _{DD} = 2.7 to 4.5V		Unit	Condition
			Min.	Max.	Min.	Max.		
A0, $\overline{CS}$	t _{AH8}	Address hold time	10	—	10	—	ns	CL = 100pF
	t _{AW8}	Address setup time	0	—	0	—	ns	
$\overline{WR}$, $\overline{RD}$	t _{CYC8}	System cycle time	note.	—	note.	—	ns	
	t _{CC}	Strobe pulse width	120	—	150	—	ns	
D0 to D7	t _{DS8}	Data setup time	120	—	120	—	ns	
	t _{DH8}	Data hold time	5	—	5	—	ns	
	t _{ACC8}	$\overline{RD}$ access time	—	50	—	80	ns	
	t _{OH8}	Output disable time	10	50	10	55	ns	

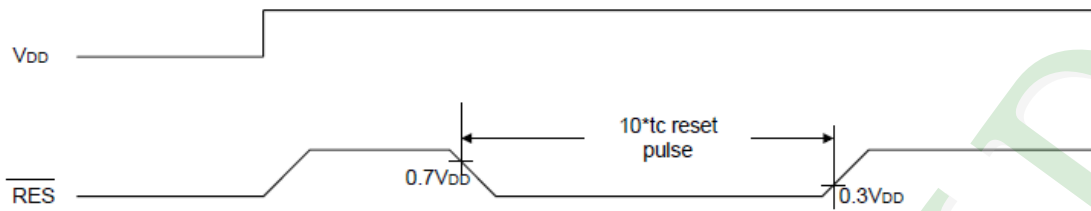
Note: For memory control and system control commands:

$$t_{CYC8} = 2t_c + t_{CC} + t_{CEA} + 75 > t_{ACV} + 245$$

For all other commands:

$$t_{CYC8} = 4t_c + t_{CC} + 30$$

Reset Timing



Reset Timing

The RA8835A series requires a reset pulse at least $10 \cdot t_c$ long after power-on in order to re-initialize its internal state. If the oscillator frequency is 10Mhz, then the Reset pulse is at least $1\mu s$. For maximum reliability, it is not recommended to apply a DC voltage to the LCD panel while the RA8835A series is reset. Turn off the LCD power supplies for at least one frame period after the start of the reset pulse.

The RA8835A series cannot receive commands while it is reset. Commands to initialize the internal registers should be issued soon after a reset. During reset, the LCD drive signals XD, LP and FR are halted. A delay of 3 ms (maximum) is required following the rising edges of both RES and VDD to allow for system stabilization.

2.4 Display Command

Class	Command	Code												Hex	Command Description	Command Read Parameters	
		RD	WR	A0	D7	D6	D5	D4	D3	D2	D1	D0	No. of			Bytes	
System Control	SYSTEM SET	1	0	1	0	1	0	0	0	0	0	0	40	Initialize device and display	8		
	SLEEP IN	1	0	1	0	1	0	1	0	0	1	1	53	Enter standby mode	0		
Display Control	DISPLAY ON/OFF	1	0	1	0	1	0	1	1	0	0	D	58, 59	Enable and disable display and display flashing	1		
	SCROLL	1	0	1	0	1	0	0	0	1	0	0	44	Set display start address and display regions	10		
	CSRFORM	1	0	1	0	1	0	1	1	1	0	1	5D	Set cursor type	2		
	CGRAM ADR	1	0	1	0	1	0	1	1	1	0	0	5C	Set start address of character generator RAM	2		
	CSRDIR	1	0	1	0	1	0	0	1	1	CD 1	CD 0	4C to 4F	Set direction of cursor movement	0		
	HDOT SCR	1	0	1	0	1	0	1	1	0	1	0	5A	Set horizontal scroll position	1		
	OVLAY	1	0	1	0	1	0	1	1	0	1	1	5B	Set display overlay format	1		
Drawing Control	CSRW	1	0	1	0	1	0	0	0	1	1	0	46	Set cursor address	2		
	CSRR	1	0	1	0	1	0	0	0	1	1	1	47	Read cursor address	2		
Memory Control	MWRITE	1	0	1	0	1	0	0	0	0	1	0	42	Write to display memory	—		
	MREAD	1	0	1	0	1	0	0	0	0	1	1	43	Read from display memory	—		

Notes:

1. In general, the internal registers of the RA8835A series are modified as each command parameter is input. However, the microprocessor does not have to set all the parameters of a command and may send a new command before all parameters have been input. The internal registers for the parameters that have been input will have been changed but the remaining parameter registers are unchanged. 2-byte parameters (where two bytes are treated as 1 data item) are handled as follows:

- CSRW, CSRR: Each byte is processed individually. The microprocessor may read or write just the low byte of the cursor address.
- SYSTEM SET, SCROLL, CGRAM ADR: Both parameter bytes are processed together. If the command is changed after half of the parameter has been input, the single byte is ignored.

2. APL and APH are 2-byte parameters, but are treated as two 1-byte parameters.

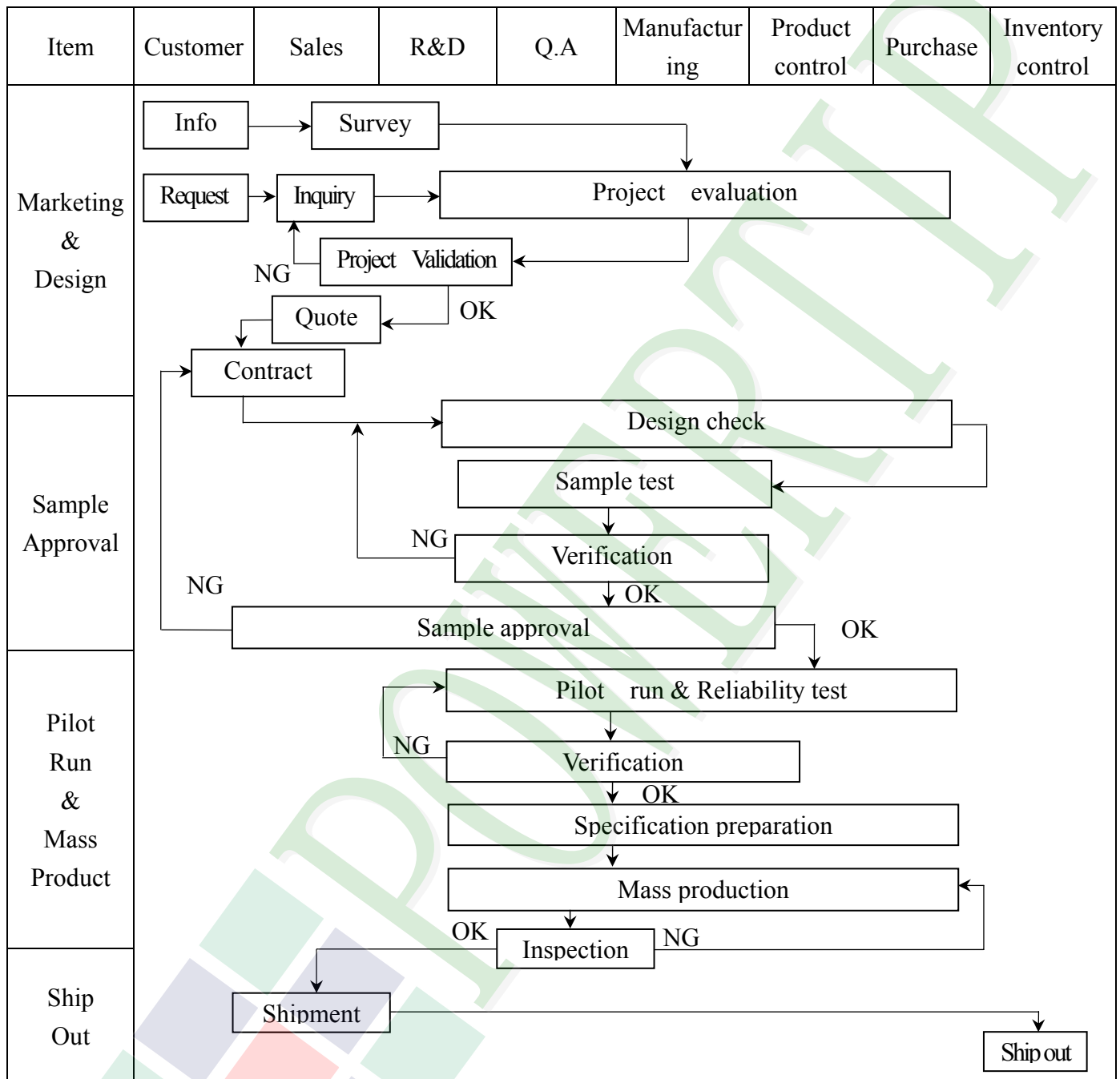
2.5 Jumper

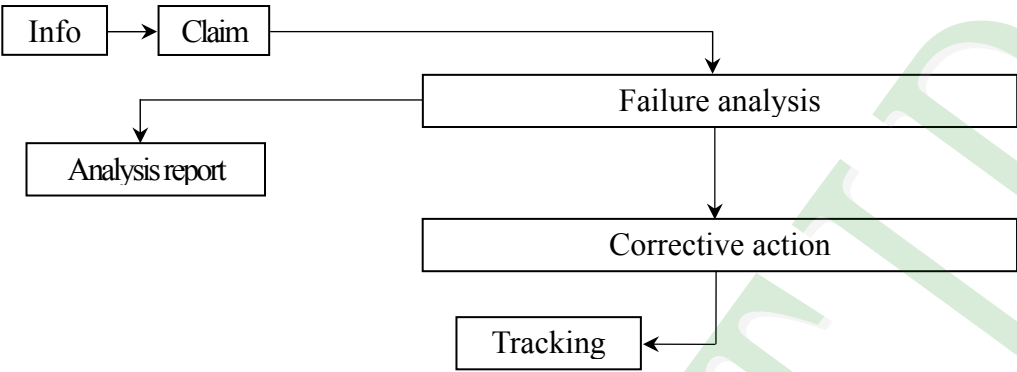
Short: JMS (2) , JP (2) , JDS (1) , JE1, JE2, JF

Open : All the jumper unnoted.

3. QUALITY ASSURANCE SYSTEM

3.1 Quality Assurance Flow Chart



Item	Customer	Sales	R&D	Q.A	Manufacturing	Product control	Purchase	Inventory control
Sales Service	 <pre> graph TD Info[Info] --> Claim[Claim] Claim --> Analysis[Analysis report] Claim --> FA[Failure analysis] FA --> CA[Corrective action] CA --> Tracking[Tracking] </pre>							
Q.A Activity	1. ISO 9001 Maintenance Activities 3. Equipment calibration 5. Standardization Management 2. Process improvement proposal 4. Education And Training Activities							

3.2 Inspection Specification

◆ **Scope** : The document shall be applied to LCD Module for Monotype and Color STN(Ver. B01).

◆ **Inspection Standard** : MIL-STD-105E Table Normal Inspection Single Sampling Level II .

◆ **Equipment** : Gauge 、 MIL-STD 、 Powertip Tester 、 Sample

◆ **Defect Level** : Major Defect AQL : 0.4 ; Minor Defect : AQL : 1.5 .

◆ **OUT Going Defect Level** : Sampling .

◆ **Manner of appearance test** :

(1). The test be under 20W×2 fluorescent light ' and distance of view must be at 30 cm.

(2). Standard of inspection : (Unit : mm)

(3). The test direction is base on about around 45° of vertical line. (Fig. 1)

(4). Definition of area . (Fig. 2)

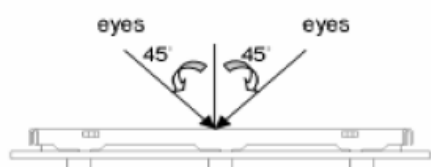


Fig.1

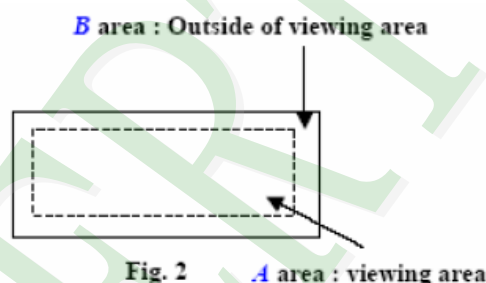


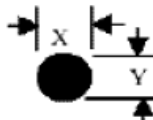
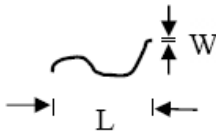
Fig. 2

◆ **Specification:**

NO	Item	Criterion	Level
01	Product condition	1. 1 The part number is inconsistent with work order of Production.	Major
		1. 2 Mixed production types.	Major
		1. 3 Assembled in inverse direction.	Major
02	Quantity	2. 1 The quantity is inconsistent with work order of production.	Major
03	Outline dimension	3. 1 Product dimension and structure must conform to Structure diagram.	Major
04	Electrical Testing	4. 1 Missing line character and icon.	Major
		4. 2 No function or no display.	Major
		4. 3 Output data is error.	Major
		4. 4 LCD viewing angle defect.	Major
		4. 5 Current consumption exceeds product specifications.	Major

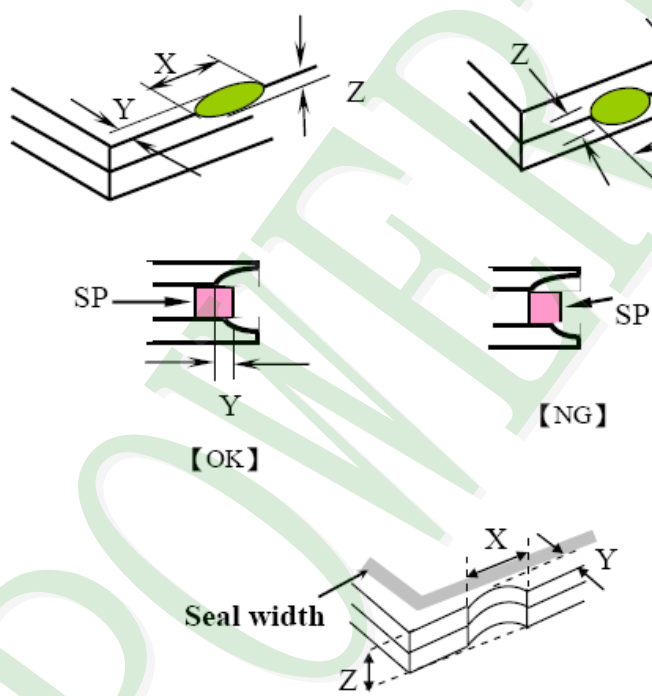
◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level																																				
05	Black or white dot 、 scratch 、 contamination Round type  $\Phi=(x+y)/2$ Line type 	5. 1 Round type: 5. 1. 1 display only : • White and black spots on display ≤ 0.30 mm , no more than 4 white or black spots present. • Densely spaced : NO more than two spots or lines within 3 mm. 5. 1. 2 Non-display : <table border="1"> <thead> <tr> <th rowspan="2">Dimension (diameter : Φ)</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>$\Phi \leq 0.10$</td> <td colspan="2">Accept no dense</td> </tr> <tr> <td>$0.10 < \Phi \leq 0.20$</td> <td>3</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$0.20 < \Phi \leq 0.30$</td> <td>2</td> </tr> <tr> <td>Total quantity</td> <td>4</td> </tr> </tbody> </table> 5. 1. 3 Line type: <table border="1"> <thead> <tr> <th colspan="2">Dimension</th> <th colspan="2">Acceptance (Q'ty)</th> </tr> <tr> <th>Length (L)</th> <th>Width (W)</th> <th>A area</th> <th>B area</th> </tr> </thead> <tbody> <tr> <td>---</td> <td>$W \leq 0.03$</td> <td>Accept no dense</td> <td rowspan="3">Ignore</td> </tr> <tr> <td>$L \leq 3.0$</td> <td>$0.03 < W \leq 0.05$</td> <td rowspan="2">4</td> </tr> <tr> <td>$L \leq 2.5$</td> <td>$0.05 < W \leq 0.075$</td> </tr> <tr> <td>---</td> <td>$W > 0.075$</td> <td colspan="2">As round type</td> </tr> </tbody> </table>	Dimension (diameter : Φ)	Acceptance (Q'ty)		A area	B area	$\Phi \leq 0.10$	Accept no dense		$0.10 < \Phi \leq 0.20$	3	Ignore	$0.20 < \Phi \leq 0.30$	2	Total quantity	4	Dimension		Acceptance (Q'ty)		Length (L)	Width (W)	A area	B area	---	$W \leq 0.03$	Accept no dense	Ignore	$L \leq 3.0$	$0.03 < W \leq 0.05$	4	$L \leq 2.5$	$0.05 < W \leq 0.075$	---	$W > 0.075$	As round type		Minor
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$\Phi \leq 0.20$	Accept no dense																																						
$0.20 < \Phi \leq 0.50$	3	Ignore																																					
$0.50 < \Phi \leq 1.00$	2																																						
$\Phi > 1.00$	0																																						
Total quantity	4																																						

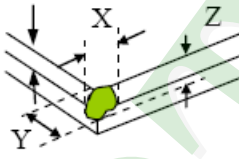
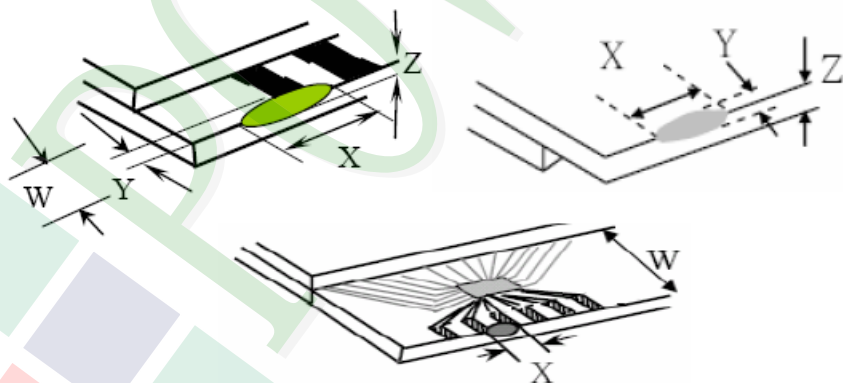
◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level						
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length	Minor						
		7.1 General glass chip : 7.1.1 Chip on panel surface and crack between panels:  <table><thead><tr><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>$\leq a$</td><td>Crack can't enter viewing area</td><td>$\leq 1/2 t$</td></tr><tr><td>$\leq a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></tbody></table>		X	Y	Z	$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$
X	Y	Z							
$\leq a$	Crack can't enter viewing area	$\leq 1/2 t$							
$\leq a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$							

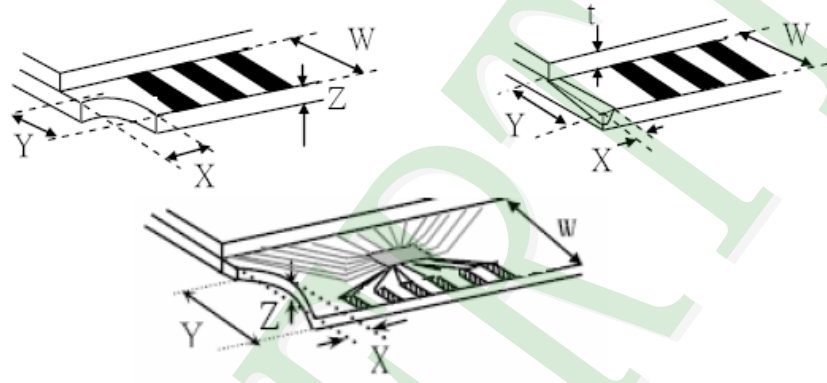
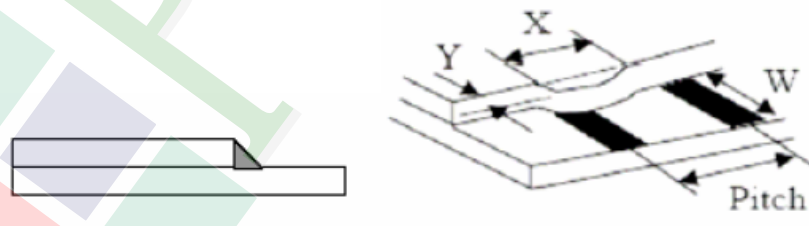
◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length 7.1.2 Corner crack :  <table><tr><th>X</th><th>Y</th><th>Z</th></tr><tr><td>$\leq 1/5 a$</td><td>Crack can't enter viewing area</td><td>$Z \leq 1/2 t$</td></tr><tr><td>$\leq 1/5 a$</td><td>Crack can't exceed the half of SP width.</td><td>$1/2 t < Z \leq 2 t$</td></tr></table>	X	Y	Z	$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$	$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$	Minor
		X	Y	Z								
$\leq 1/5 a$	Crack can't enter viewing area	$Z \leq 1/2 t$										
$\leq 1/5 a$	Crack can't exceed the half of SP width.	$1/2 t < Z \leq 2 t$										
7.2 Protrusion over terminal : 7.2.1 Chip on electrode pad :  <table><tr><th></th><th>X</th><th>Y</th><th>Z</th></tr><tr><td>Front</td><td>$\leq a$</td><td>$\leq 1/2 W$</td><td>$\leq t$</td></tr><tr><td>Back</td><td colspan="3">Neglect</td></tr></table>		X	Y	Z	Front	$\leq a$	$\leq 1/2 W$	$\leq t$	Back	Neglect		
	X	Y	Z									
Front	$\leq a$	$\leq 1/2 W$	$\leq t$									
Back	Neglect											

◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level									
07	The crack of glass	Symbols : X : The length of crack Z : The thickness of crack t : The thickness of glass Y : The width of crack. W : terminal length a : LCD side length	Minor									
		7.2.2 Non-conductive portion :  <table border="1"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>$\leq 1/3 a$</td> <td>$\leq W$</td> <td>$\leq t$</td> </tr> </table> ⊙ If the chipped area touches the ITO terminal, over 2/3 of the ITO must remain and be inspected according to electrode terminal specifications. 7.2.3 Glass remain :  <table border="1"> <tr> <td>X</td> <td>Y</td> <td>Z</td> </tr> <tr> <td>$\leq a$</td> <td>$\leq 1/3 W$</td> <td>$\leq t$</td> </tr> </table>		X	Y	Z	$\leq 1/3 a$	$\leq W$	$\leq t$	X	Y	Z
X	Y	Z										
$\leq 1/3 a$	$\leq W$	$\leq t$										
X	Y	Z										
$\leq a$	$\leq 1/3 W$	$\leq t$										

◆ Specification For Monotype and Color STN :

(Ver. B01)

NO	Item	Criterion	Level
08	Backlight elements	8. 1 Backlight can't work normally.	Major
		8. 2 Backlight doesn't light or color is wrong.	Major
		8. 3 Illumination source flickers when lit.	Major
09	General appearance	9. 1 Pin type must match type in specification sheet.	Major
		9. 2 No short circuits in components on PCB or FPC.	Major
		9. 3 Product packaging must the same as specified on packaging specification sheet.	Minor
		9. 4 The folding and peeled off in polarizer are not acceptable.	Minor
		9. 5 The PCB or FPC between B/L assembled distance (PCB or FPC) is ≤ 1.5 mm.	Minor

5. PRECAUTION RELATING PRODUCT HANDLING

5.1 SAFETY

- 5.1.1 If the LCD panel breaks , be careful not to get the liquid crystal to touch your skin.
- 5.1.2 If the liquid crystal touches your skin or clothes , please wash it off immediately by using soap and water.

5.2 HANDLING

- 5.2.1 Avoid any strong mechanical shock which can break the glass.
- 5.2.2 Avoid static electricity which can damage the CMOS LSI—When working with the module , be sure to ground your body and any electrical equipment you may be using.
- 5.2.3 Do not remove the panel or frame from the module.
- 5.2.4 The polarizing plate of the display is very fragile. So , please handle it very carefully ,do not touch , push or rub the exposed polarizing with anything harder than an HB pencil lead (glass , tweezers , etc.)
- 5.2.5 Do not wipe the polarizing plate with a dry cloth , as it may easily scratch the surface of plate.
- 5.2.6 Do not touch the display area with bare hands , this will stain the display area.
- 5.2.7 Do not use ketonics solvent & aromatic solvent. Use with a soft cloth soaked with a cleaning naphtha solvent.
- 5.2.8 To control temperature and time of soldering is $320 \pm 10^{\circ}\text{C}$ and 3-5 sec.
- 5.2.9 To avoid liquid (include organic solvent) stained on LCM .

5.3 STORAGE

- 5.3.1 Store the panel or module in a dark place where the temperature is $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ and the humidity is below 65% RH.
- 5.3.2 Do not place the module near organics solvents or corrosive gases.
- 5.3.3 Do not crush , shake , or jolt the module.

5.4 TERMS OF WARRANTY

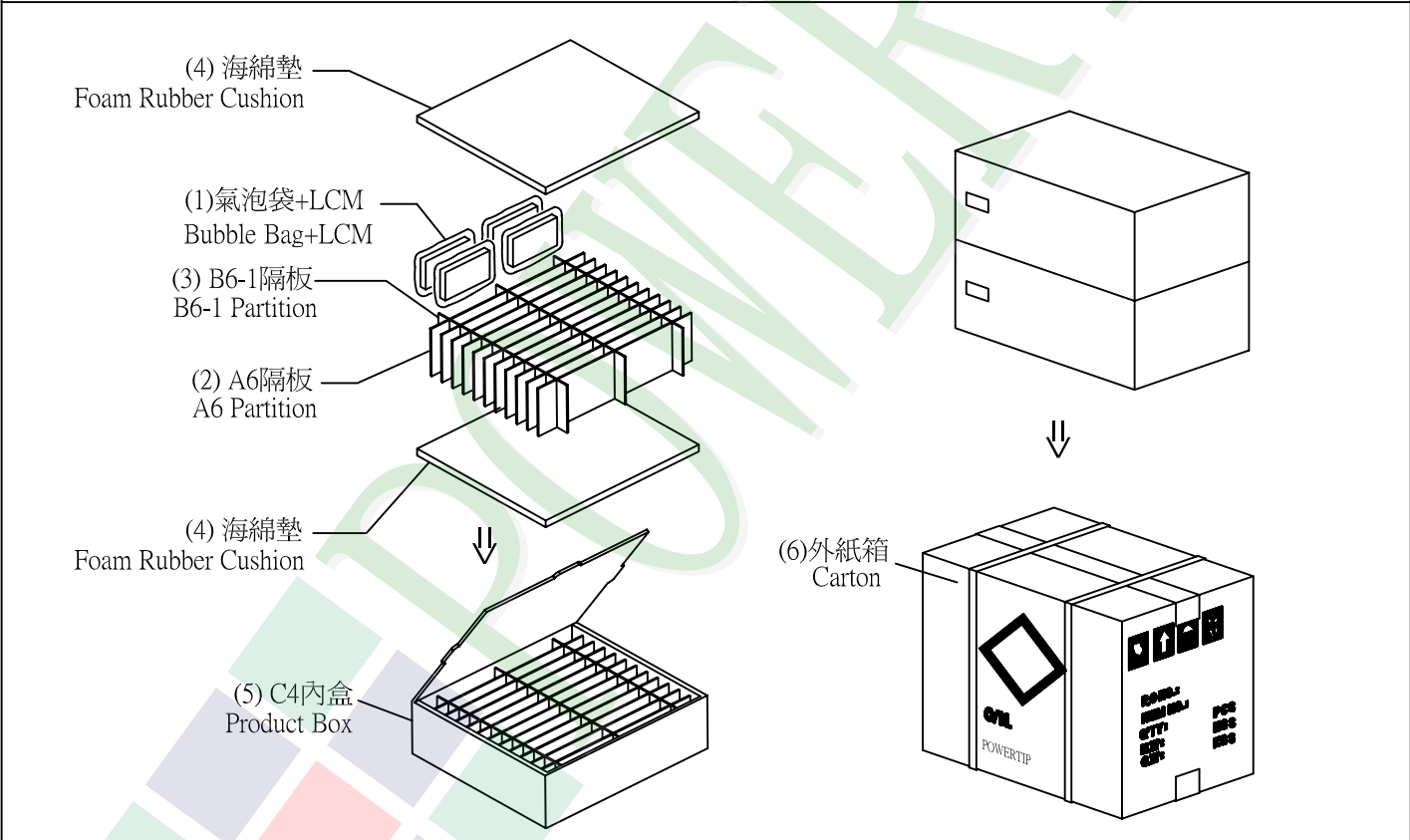
- 5.4.1 Applicable warrant period
The period is within thirteen months since the date of shipping out under normal using and storage conditions.
- 5.4.2 Unaccepted responsibility
This product has been manufactured to your company's specification as a part for use in your company's general electronic products. It is guaranteed to perform according to delivery specifications. For any other use apart from general electronic equipment , we cannot take responsibility if the product is used in nuclear power control equipment , aerospace equipment , fire and security systems or any other applications in which there is a direct risk to human life and where extremely high levels of reliability are required.

	A	B	C	D	E	F	G	H	
1	148.02±0.5 136.2 120.14(V.A) 115.18(A.A) 98.2±0.3 112.20±0.10 120.24±0.5 105.4 92.14(V.A) 86.38(A.A) 9.51 4.44 7.11 4.02 21.0MAX 10.5 1.6±0.15 139.98±0.10 4.02 21.06 20 19 2 1.0 0.34 0.36 HOLE 4-φ3.5 PAD 4-φ5.0 HOLE 20-φ1.0 PAD 20-φ1.8 VIEWING DIRECTION 320x240 DOTS Red & White Line: 210.0±10.0 RED LINE (+) (-)								
2	DOTS DETAIL SCALE: 20/1 0.34 0.36								
3	Red & White Line: 210.0±10.0 0.34 0.36								
4	VIEWING DIRECTION VIEWING DIRECTION								
5	HOLE 20-φ1.0 PAD 20-φ1.8 20 19 2 1.0 0.34 0.36								
6	NOTES: 1. a=P2.54x9=22.86±0.1, b=2.54±0.1 2. The tolerance unless classified ±0.3mm 3. LCD Type: FSTN 4. LCD Mode: Positive/Transflective 5. Top: -20~70°C Tst: -30~80°C 6. View Direction: 6 O'CLOCK 7. This product conforms ROHS.								

Ver.001	LCM包裝規格書 LCM Packaging Specifications		Approve	Check	Contact
Documents NO.	JPKG-PG320240WRFDBAH31Q		Ryan	Terry	Air

1.包裝材料規格表 (Packaging Material) : (per carton)						
No.	Item	Model	Dimensions (mm)	1Pcs Weight	Quantity	Total Weight
1	成品 (LCM)	PG320240WRFDBAH31Q	148.02 X 120.24	0.265	36	9.54
2	氣泡袋(1)Bubble Bag	BAG170150BRABA	170 X 150	0.0045	36	0.162
3	A6隔板(2)A6 Partition	BX33800012BZBA	338 X 125 X 3	0.0148	22	0.3256
4	B6隔板(3)B6 Partition	BX00000000056	298 X 125 X 3	0.023	6	0.1362
5	海綿墊(4)Foam Rubber Cushion	OTFOAM00005ABA	330 X 290 X 10	0.025	4	0.1
6	C4內盒(5)Product Box	BX36031014AABA	360 X 310 X 142	0.324	2	0.648
7	外紙箱(6)Carton	BX39432432CCBA	394 X 324 X 321	0.65	1	0.65
8						
9						

2.一整箱總重量 (Total LCD Weight in carton) : 11.56 Kg±10%						
3.單箱數量規格表 (Packaging Specifications and Quantity) :						
(1)Quantity Of Spacer : A6隔板 X 11 , B6隔板 X 3						
(2)Total LCM quantity in carton : quantity per box 18 x no of boxes 2 = 36						



特 記 事 項 (REMARK)		
4. Label Specifications : 標籤依廠內標準作業	5. LCM排放示意圖(前、中、後間隔不放置): 5. LCM placed as figure showing: (First middle and last slot should be empty)	
	 ■ 模組(LCM) X 1pcs.	